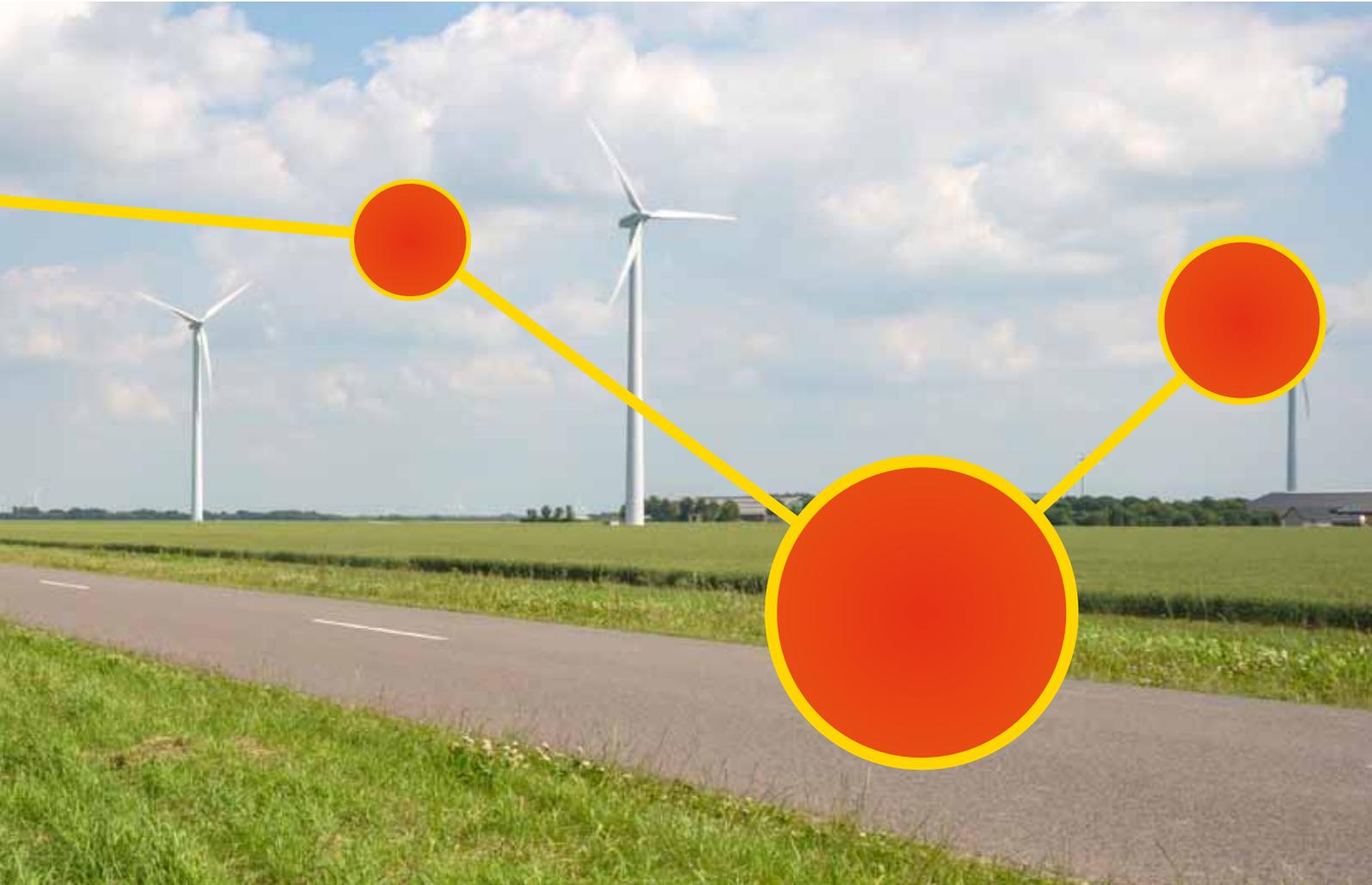




TOPSECTOR ENERGIE

Empowering the new economy



Sustainable energy: innovation is key



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Around the world, energy and the energy sector are in transition, and the Netherlands is no exception. Developments such as the move towards sustainable energy and ongoing internationalisation repeatedly raise the question of how the Dutch government can provide the energy sector with effective support in order to make the best use of economic opportunities in this process. It is helpful to work with a vision for the year 2020, in which the Dutch energy sector is strong, competitive, and innovative - a sector that seizes the international opportunities that emerge from market developments and from the European targets for 2020 and 2050. From the perspective of this vision, it is desirable that the Dutch energy sector manages to make a transition between now and 2020 to a more sustainable, low-carbon sector, while at the same time managing to structurally increase the earnings potential. The recently agreed SER (Social and Economic Council of the Netherlands) Energy Agreement for Sustainable Growth confirms the picture that the necessary transition enjoys broad support. The agreement has a strong focus on the role of innovation and export.

A breakthrough is needed to ensure the energy transition takes place; we need a quantum leap. How? Through

innovation. On the one hand, by utilising existing technologies, but on the other hand by also developing new technologies, for instance, to generate biobased energy, offshore wind energy and solar energy. A good example of an existing technology that holds great potential is the smart grid. Smart grids are at the heart of sustainable energy production. They are enablers that make it possible to share power generated at disparate locations - e.g. from solar panels - in a decentralised way and to return surpluses back to the grid. Energy-saving solutions also form an important resource in further reducing CO2 emissions. Great gains are still to be made in industry and in the built environment. In the transition to sustainable energy production, there is also an important role for gas as a replacement for fuels with a high environmental impact.

Innovation is of great significance for the Dutch economy. It can create employment and boost exports. Here, it is important to focus on areas where the Netherlands can blaze a trail, where we are strong competitors. One such area is the ongoing refinement of solar panel productivity. But given Dutch experience in the offshore industry, another area is our expertise in building offshore wind turbine support structures. We need to include a variety of technologies in the transition.

In my view, we can only speak of a transition if one-quarter to one-third of our energy is produced from sustainable sources. This is going to take time. At present, only four percent of our energy is produced sustainably. This falls short of the mark, especially in comparison with our neighbouring countries. One of the reasons for this is the time to market: we will not see the ideas of today as a product on the market next year. It often takes years or even decades before a technology becomes economically viable. Financial backers need to have a reason to invest, they need to see the commercial benefit to continue with technological development. Only then will there be a step change in the pace; the price drops as you start to increase production. This is the point where things really take off.

Cooperation between the Netherlands' golden triangle of the business community, government and research institutions, with a strong focus on public acceptance, as is the case in the Top Sector Energy, will be essential. Internationally, I have noticed that our international partners are often impressed by how we achieve this in the Netherlands. In terms of innovation, it is clearly one of the strengths of the Netherlands.

An aerial view of an offshore wind farm in the North Sea. Several white three-bladed wind turbines are visible, each mounted on a yellow jacket structure. In the foreground, a blue and orange service vessel is positioned around a yellow jacket structure, likely performing maintenance or construction. The sky is blue with scattered white clouds.

*“The Dutch Approach: joining forces
for serious innovation.”*

Dutch Top Sectors

These are the sectors in which the Netherlands excels globally and which receive high government priority. They are as follows: Water, Agri-food sector, Horticulture and starting materials, High Tech, Energy, Logistics, Creative Industry, Life Sciences and Chemicals. All top sectors have a strong international position. Industry and science share a wealth of knowledge and jointly develop innovations. Products and technologies produced by these top sectors contribute to finding solutions to societal issues.

Action plans

The top sector approach is geared towards providing a solid exchange between businesses, knowledge institutes and the government (the 'golden triangle'). The government does not make its own proposals for the sectors, but invites businesses and scientists to draw up action plans.

A top team has been put together for each sector, consisting of:

- an innovative SME entrepreneur;
- a scientist;

- a civil servant;
- a standard bearer for the sector.

The top teams talked to businesses and scientists and mapped out the various opportunities and challenges. They presented action plans detailing their ambitions, what they advise and a plan of approach. Items that are dealt with in all plans:

Knowledge and research

Knowledge must be converted into new products and services faster. This

can be achieved if businesses, the government and knowledge institutes step up cooperation. They can bundle specialist research. For this there are plenty of opportunities. Institutes like the NWO (the Netherlands Organisation for Scientific Research), KNAW (the Royal Netherlands Academy of Arts and Sciences), TNO (Netherlands Organisation for Applied Scientific Research) and the large technology institutes are adjusting their programmes to the top sectors.

Foreign policy

The objective: to support top sectors through Dutch foreign policy. The top sectors will be the focus of economic diplomacy for instance, or foreign missions, or proposals to involve businesses in development aid. Moreover, efforts will be made to attract foreign companies and top talent to the Netherlands.

Conditions for the sectors

The objective: to remove as many obstacles as possible in areas such as tender regulations, healthcare regulations, spatial planning, infrastructure and tax schemes.

Education and training

The objective: to improve education and training. For instance through exchange programmes between schools and businesses, or by closing the gap between education and the

needs of industry. Professional training institutes and the industry could work together in defining educational needs for instance. Or schools and institutions in professional education could be challenged to specialise in a particular sector through Centres of Excellence and Centres for Innovative Professionalism.

Sustainability

The objective: to make sectors more sustainable. The transition to a bio based economy is an important theme for the top sectors to stimulate innovation and economic growth.

“The top sector approach starts to deliver. In 2012 the total spending on innovation increased from €12,1 to €12,9 billion. That’s an increase of 6,5% in a year.” Minister of Economic Affairs mr. Henk Kamp, November 6th, 2013



Top Sector Energy: Empowering the new economy

Clean and efficiently generated energy which strengthens the Dutch economy. This is what the Top Sector Energy aims to achieve. Energy innovations contribute to the reduction in costs and CO2 emissions, the development of renewable energy sources and the smarter utilisation thereof. Energy research and innovation are the support bearers of the fundamental transition towards CO2-free Dutch energy management.

Clean and efficiently generated energy which strengthens the Dutch economy. This is what the Top Sector Energy works towards. Energy innovations contribute to the reduction in costs and the reduction in CO2 emissions, the development of renewable energy sources and the smarter utilisation thereof. The Top Sector Energy contributes to the creation of economic opportunities for Dutch companies, and in doing so, also to competitiveness, job opportunities and prosperity. The technological and social innovations give the energy sector a leading

position in the new global economy. In 2013, 383 public sector and private sector organisations will be investing financially in the Top Sector Energy, almost half of which are businesses in the SME segment.

The Top Sector Energy consists of seven Top Consortia for Knowledge & Innovation (TKIs) which provide a forum for the business community, research institutions and the government to work together on sustainable growth. These are Offshore Wind, Gas, Switch2SmartGrids, EnerGO,

Solar Energy and – shared with the Chemicals Top Sector – Biobased Economy and ISPT (sustainable process technology).

Progress

Much has already been achieved within the Top Sector Energy. Here are some of the principal results:

- The initial years have been used to mobilise partners and to establish the organisation. The ambitions of businesses and research institutions have been translated within the TKIs to programme lines and

concrete research programmes. In a short space of time, an innovation portfolio encompassing many hundreds of projects has been formed. Around 130 projects were started in 2012 and 2013, and a new series of projects is set to launch in 2013.

- The focus of the R&D programmes of the Energy Research Centre Netherlands (ECN) and the Netherlands Organisation for Applied Scientific Research (TNO) has been shifted to the themes of the Top Sector Energy. TNO is involved in the TKIs EnerGO and Switch2SmartGrids, while ECN is involved in the TKIs Offshore Wind, Gas, Solar Energy, Biobased Economy and ISPT.
- The Top Sector Energy has prepared a Human Capital Agenda to facilitate a good match between education & training and the

labour market. In this context, the Top Sector Energy became a co-signatory to the Technology Pact on 13 May 2013. This pact aims to close the gap between education and the labour market in the technology sector, thus helping to reduce the shortage of skilled technologists.

- The STEM programme was established to ensure a link between the Top Sector Energy and society by providing a stimulus for investments in the field of social innovation.

Moving forward

The key policy themes of the Top Sector Energy moving forward are:

- To obtain more projects in the demonstration and deployment phase, so that innovations can be proven in the market.
- Ongoing strengthening of the ties

between the Top Sector Energy and the SME segment. This will involve the preparation of an SME enterprise plan. The TKIs special SME desks will ensure that the threshold for participation by SMEs is as low as possible.

- Taking the internationalisation agenda to a higher level so that the position of the energy-related business community in the Netherlands is broadened and strengthened on the world stage. This will require careful alignment with the European Horizon 2020 programme.
- Better alignment with regional and local government bodies for the relevant TKIs and increased cooperation within them. The project Power to the Region in the Top Sector Energy was launched for this reason. Its aim is for central government and the regions to

pick up appealing energy-related projects and accelerate them.

- Ensuring that the programming of fundamental research is in line with the themes of the Top Sector Energy. Outline agreements have already been put in place with the Netherlands Organisation for Scientific Research (NWO) for this purpose. These agreements will be further fleshed out in 2014 and 2015.
- To make a key contribution to elaborating the SER's Energy Agreement. The Top Sector Energy has been designated as the coordinator of a considerable number of agreements reached, in particular for the ninth basic component: 'A stimulus for commercial operation for growth and export'.

In September 2013 the Dutch National Energy agreement for sustainable growth was reached. This agreement sets the markers for the Dutch energy transition and defines a clear need for energy innovation.



Internationalisation

Objective

The ambition of the Top Sector Energy is for every TKI to have a focused internationalisation plan. This plan will encompass activities which the knowledge and research institutions, but primarily also SMEs in the energy sector need. It should be made as easy as possible for Dutch businesses to venture across borders and for business from abroad to get in touch with the Top Sector Energy. Agency NL and the overseas network (embassies and Innovation Attachés) have the knowledge, information, experience and the network needed to help businesses and answer their questions.

Approach

The Top Team will make government funding available to generate collaborative projects: subsidies, advice, implementation and instruments to support all aspects of internationalisation that are conducted through Agency NL. The ambition of the Top Team is to mobilise existing sources, information and knowledge to map out promising market-sector combinations. Strengthening international networks (Horizon 2020, IEA, etc.) is also part of this.



The seven Top Consortia for Knowledge & Innovation

The seven TKIs within the Top Sector Energy are Offshore Wind, Gas, Switch2SmartGrids, EnerGO, Solar Energy and – shared with the Chemicals Top Sector – Biobased Economy and ISPT (sustainable process technology).

TKI Offshore Wind (Wind op Zee)

The ambition of the TKI Offshore Wind (TKI WoZ, Wind op Zee) is a reduction in the cost price for offshore wind energy and an increase in the Dutch share in turnover and job opportunities in this international sector. TKI WoZ will achieve this in the form of a R&D programme: based on five innovation themes, companies and professional associations perform projects collectively. Furthermore, the initiative for the Leeghwater Project was taken: a pilot project / demonstration wind farm which facilitates wind farm innovations to the maximum extent. Strategic workflows were also defined, such as in the area of training and international coordination, to strengthen the sector.

TKI Gas

The gas sector, and with that the energy supply as a whole, is faced with real challenges. An important part of the challenges will have to be solved through innovation. Only through continuous development and learning will gas be able to fulfil its potential, for the benefit of the transition towards sustainable energy management, and for the benefit of the international position of the Netherlands. TKI Gas wants to emphatically involve the entire gas sector in the necessary transition and innovation. TKI Gas takes up various interconnected matters: greening of the actual structure of the gas market, gas as an enabler for volatile renewables such as wind and solar power, and gas as a substitute for fuels that are severely eco-polluting. TKI Gas also works on smarter production and application of gas, and on innovations in efficiency in the entire energy mix. The five programme outlines from the Innovation Contract for Gas were individually converted to the 5 main outlines of TKI Gas. These are Upstream, Small Scale LNG, Green Gas, System Function of Gas and Social Integration. The TKI has a network of approximately 120 companies and organisations surrounding it.

TKI ISPT

The TKI ISPT has drawn up an innovation contract in which companies, professional associations and the government work together on the reduction of energy consumption and energy efficiency in process technology. The ambition is to provide a significant contribution to the utilisation of the energy savings potential in industry. Within the Institute for Sustainable Process Technology (ISPT), companies and professional associations already work together on innovations in process technology. The objectives of TKI ISPT link up with this in a seamless fashion. TKI ISPT conducts projects for the Top Sector Energy, for the theme: Energy Savings in the Industry (EBI) (Energiebesparing in de industrie). TKI ISPT also conducts projects for Top Sectors Chemicals Industry (Chemie) and Agri-food.

TKI Switch2SmartGrids

TKI Switch2SmartGrids (TKI S2SG) prepared an innovation contract in 2012, in which companies, professional associations, governments, energy initiatives and other organisations work together on innovations regarding smart grids. An important part hereof is the organisation of the 'ecosystem'. This is the network around smart grids, in which different parties act mutually to achieve more flexibility in the energy supply, with new products and services, and in so doing, help to make this energy supply more sustainable. The ecosystem is organised around four programme outlines: products and services, virtual infrastructure, physical infrastructure and institutional and social innovation.

TKI Solar Energy

The Netherlands holds an excellent knowledge and technological position in the field of solar power, or photovoltaic solar power (PV). Furthermore, the use of solar power in our country has increased dramatically during recent years. TKI Solar Energy wants to further accelerate the development and application of solar power in the Netherlands, and wants to ensure that the added

TKI EnerGO

Energy consumption in the built environment comprises approximately 40% of our national end-user consumption. Innovation can potentially lead to 1000 PJ in energy savings, 50,000 new jobs and approximately 10 billion Euros in additional turnover. Existing techniques make a great deal possible, but certainly fall short. Pioneering innovation in various fields is required for this purpose. TKI EnerGO gives this a shot in the arm. In 2012, budget was allocated to 9 projects. TKI EnerGO is a foundation with a management board, a programme committee and a programme office.

TKI Biobased Economy (TKI BBE)

The TKI Biobased Economy (BBE) is directed at the production of biobased innovation across the entire biomass value chain, from field to end product, including the recycling of industrial and domestic streams. TKI BBE is organised around six programme outlines: high-quality energy carriers, high percentages of additional and auxiliary firing, biorefinement, chemical and biotechnological conversion technology, Aquatic Biomass (including BioSolar) and Economy, Policy and Sustainability (EBD). The TKI has a network of approximately 100 companies, research institutes and non-government organisations surrounding it.

value to the Dutch economy is maximised. The TKI elected three programme outlines for this purpose: Systems and Applications, Wafer-based Silicon PV Technologies and Thin Film PV Technologies. Currently, approximately 60 companies and professional associations participate in TKI Solar Energy. This number will grow further in the coming period. Partners in

projects under TKI Solar Energy focus on the development of efficient, less expensive and sustainable solar panels, including the equipment and materials for the manufacture thereof. They also work on the integration of solar power systems in the built environment, infrastructure and the electricity grid.

Contact

Further information on the Top Sector Energy can be found at:
www.topsectorenergie.nl.

Top Team and Control Team

In the organisation and governance of the Top Sector Energy, the golden triangle (government, research institutions and the private sector) is a recurring feature.

The Top Team is comprised of a respected business leader from the sector, a representative from the field of science, a senior civil servant and an innovative entrepreneur from the SME segment. The Top Team constitutes the governing body and has ultimate responsibility for the Top Sector Energy.

The Top Team is supported by a secretariat in which the government, research institutions and the private sector are represented.

The Top Team is assisted by the Control Team. The Control Team is comprised of leading stakeholders from the energy sector (on behalf of businesses, research institutions and social institutions). The Control Team advises the Top Team on the substantive choices and strategy.

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TKIs

The seven TKIs organise the innovation contracts and implement them. The TKIs consist of businesses, research institutions and the government: the golden triangle.

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